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779 family. Babies lacking in merit died at their birth, just as mothers whose merit had run low suffered or died in childbirth.

84 A soul desiring rebirth flew into the womb of a woman at
[775] conception. By care and imitative magical practices, both
774 parents helped the fetus grow but the mother gave the baby its
[789] body. Parturition was a joint effort of mother and child, the course and outcome of which was determined by their respective stores of merit. After delivery the child was blessed, his soul seized and tied in, and ritual means taken that he not
846 wander from home throughout life. A post-partum rest of
392 several days was taken beside a hot fire, the purpose of which was both physiological, i.e. to dry the uterus, and ritual, to bring about full "ripe" adulthood.

The fire, which was consecrated, strengthened a woman and made her a better nourisher, mature, more compassionate, and eligible to handle magic and the tender souls of living creatures. Thus she was fitted for her life-calling as a woman.
793 The comparable ceremony of maturation for men, when they too
789 were changed from "raw" to mature, compassionate, and strong
562 males for their calling of fatherhood and leadership, was ordination into the Buddhist priesthood. Only those men and women who had undergone their respective rites of maturation were eligible to handle magic. Men's magic gave power, control and could be aggressive. Women's magic was limited to
[688] nurturing purposes, and could never be destructive. The respective areas of magical competence and right were autonomous and rigidly separated on pain of severe sanctions.

844 This view of the role of women in life and the events of childbirth in the earthly and cosmic scene, had the effect of giving women in childbirth a positive, secure, and relaxed outlook, and an understanding and acceptance of suffering so that they had little fear.

[128] How careers in midwifery, whether professional or amateur were established, and the nature of the specialty and of a practice are discussed.

128 The understanding of, and the attitudes toward, modern
844 medicine are given along with findings accounting for
846 acceptance or rejection of modern hospital care for parturients.
369 Accepting the changes that were observed in the practices
178 surrounding childbirth proved to be a means of expressing partial withdrawal from the old life of a farmer and a step towards the glitter of urban ways. In the desire to be seen as progressive, the fire rest had been shortened, market products substituted for the consecrated fire, and other urban ways introduced.

000 For persons interested in introducing changes in the

are more reliable than the new," implying familiarity with both. One Buddhist headman earnestly sought of the field-worker information on medicines, or "mechanical devices" about which he had heard, but bemoaned the costliness.

To the concepts underlying childbirth, both as physiological processes and their meanings in Bang Chan's world view, we devote the next chapter.

7. Hauck (1956) finds that the number of pregnancies compared to the years of marriage is so low as to suggest (1) relatively low fertility in many cases, or (2) the existence of some (unknown) method of birth-control (pp. 31-32). She finds an unusual feature of menstrual history as compared to western standards in a somewhat older age at menarche (median and modal age was 15, with a range from 13-19 years). The onset of menopause occurred anywhere from 38-45 or even later, which is somewhat later than in western societies (pp. 30-31).

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magical formulae and incantations (khāthā cf. Textor 1960:80-88; 67-79). It was one of the branches of occultism (saiyasāt [McF. 1940:895]), the ancient science which sought by magical means to control the forces of the heavens and of earth and to manipulate them in behalf of man's interests and enterprises, whether economic, aesthetic, personal, or other. Some of the other branches were dancing, singing, the agricultural rites, boxing, boat- and house-building, and the life-cycle rites. This powerful wisdom was contained in sacred books at the Buddhist temple where it passed, usually orally, from priest to priest. It could be transmitted away from the temple between men, if they had once been ordained. Its transmission was controlled by ritual teacher-pupil relations, and its use by formal request through presentation of a sacred offering, the khwan khaō (cf. Dūan's Tale p.44). Unauthorized magic did not work because it was not validated by its supernatural discoverer; improper ritual behavior incurred strong supernatural sanctions. Instruction in magic and its use was free except for the token offerings and coin in the khwan khaō. The only rigid obligation was a public annual homage-to-the-teacher ritual (wai khrū).

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The persons authorized to handle any part of saiyasāt were called mō. In the context of medicine, mō was translated "doctor." To keep the modern and ancient traditions separate, we shall use the Thai word "mō" throughout this paper for the practitioner of the ancient occult art, reserving the word "doctor" for physicians trained in modern medicine.

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The field of medicine was split into categories or specialties. There were, for instance, the exorcisers of spirits or disease objects (mō phī), and the curers (mō raksā) who made up decoctions particularly for element imbalances. Astrologist-foretellers (mō dū) analysed disturbances due to astral confluences; soul-ceremonialists (mō khwan) carried on the khwan-strengthening rites; and the mō sanē specialized in love and hate magic. On a lower plane were masseurs (mō nūat) and midwives (mō tamyāe). No specialist could operate in the field of another unless he had formally acquired that specialty. No limits, though, were set on the number of specialties a person might acquire so that all their lives, mō were open to and seeking new knowledge by pilgrimage, discussion, or visit to a Chinese or modern druggist. The major curing specialties were only in the hands of males, but men and women both practiced the minor branches of midwifery and massaging.19

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19. A woman medium (khonsong) who cured when possessed by the spirit of a male mō was not entitled to be called mō. Her special circumstances are discussed in "Magic and Maturity."

[787]

INTRODUCTION

121 This study of food habits and nutrient intakes in a Siamese rice village was undertaken in connection with the Cornell Thailand Project. The project is one of several under the auspices of the Department of Sociology and Anthropology, which are focused on the process of cultural change
114 in non-industrialized societies. Dietary studies designed to contribute to a base-line description of the community were carried out from September, 1952 through May, 1954. Local headquarters, where members of the research group kept equipment, and could stay overnight, were maintained in the village.

128 The observations to be reported fall into two general categories: 1) descriptive information concerning many aspects of the food situation in Bang Chan and 2) quantitative information on food intake, and its estimated nutrient
126 value, for 11 selected families. Qualitative information on food in Bang Chan was obtained from several sources: 1) field notes made by various members of the Cornell research group, 2) structured interviews with mothers about their own food, and that of small children in the family, 3) records of food eaten during 24-hour periods, submitted by children in the third and fourth grades of the elementary school as homework for the health class, and 4) weighed dietary studies carried
114 out in 11 selected households. Quantitative information on food intakes was obtained from the latter source only. Most of the data to be presented were obtained between September 1952 and June 1954, but supplementary information was obtained from a diary for 1955, kept by a school teacher at the request of the research group, a study of innovations made by Ralis in May 1955 (Goldsen and Ralis, 1957) and information provided at our request by members of the Cornell research group who were in Thailand in the summer of 1957.

A general account of the economic, political and social organization of Bang Chan in 1948-49, together with some material on health and diet was given in the first interim report issued on the Thailand Project (Sharp et al., 1953). The second interim report concerned aspects of health, sanitation and nutritional status in Bang Chan in 1952-54 (Hauck, 1956), and the third was a report on factors related to acceptance of innovations (Goldsen and Ralis, 1957).

THE COMMUNITY

Location, Climate, Transportation

131 Bang Chan is situated in the rice-producing area of central Thailand, about twenty miles by road northeast of Bangkok.

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132 Bangkok. The tropical monsoon climate divides the year into three seasons, a hot, wet season from late May to November, a cooler, dry season from December to early February, and a hot, 361 dry season from late February to mid-May. The community, scattered over an area of approximately five square miles, was 161 composed of seven neighboring hamlets. In 1954, the population 162 was approximately 1700, divided among 336 households. About 60 per cent of the households were made up of independent families, parents with unmarried children, with an average family [943] size of 5.7 persons. The main occupation of 80 per cent of all families was rice farming.

243 The climate together with the overflowing Chao Phraya [13] river, provided natural conditions for raising a single crop [220] of wet rice. From May or June to February, the principal activities were those connected with rice production. This crop greatly exceeded the needs for local consumption as human food, [435] feed, and seed. The surplus of rice which was sold, was estimated for 1953 as 1.4 times the amount used for all purposes within the village (Janlekha, 1955).

346 Wat Bang Chan, the Buddhist monastery and place for re- 621 ligious exercises, was also the center of social life in the [795] community. When data for this study were being gathered, the one primary school in the village was located on the grounds of the wat. The community was defined simply by the clientele which patronized Wat Bang Chan and this elementary school. [563] Within the area of the community lived a small minority of Thai Moslems who patronized a mosque and school just outside Bang Chan. The few Chinese in the village were considered as part of the Thai-Buddhist community. Information to be presented • 028 on food habits refers primarily to habits of the Buddhist majority, although some reference will be made to ways in which Moslem practices differed therefrom.

133 Although for six or more months of the year the fields 243 were covered with water, sometimes to a depth of a meter or 491 more, a year-round road, connecting Bangkok and Minburi, the nearest market town, ran through one edge of the village. Bus 484 service was available along this road, to either Bangkok or 487 Minburi but within the community one went by boat on the net- [496] work of canals during the wet season, and during the dry season, [501] on foot along the dikes or across fields. From late January through May, when subsidiary canals were apt to be dry, getting about was somewhat difficult. Boat travel was considered easy, but as many families had only one boat, a trip to the store or even to a neighbor's home had to be planned with reference to the activities of other family members.

443 Large scale purchases, as for a ceremony, were always made at a big market, but in general, instead of people going to the market-town, the "market" came to the people. Boat-venders brought not only fresh produce and staples but also sweets, ices, soft drinks, and cooked foods such as Chinese

251 which did not attract them could be left anywhere out of reach of dogs. Raw rice was stored in a large jar or oil can while salt, fermented fish, shrimp paste[1] and fishsoy[1] were kept in smaller jars or bottles. Such containers were customarily covered. Dried food materials such as onions, garlic, chili peppers and other seasonings were often kept in a basket hung from the roof. Paddy, i.e. unhusked rice, was kept in a large bin of matting or wood, the excess sometimes simply piled on an uncovered mat on the floor.

128 Descriptions of two kitchens, one in a relatively prosperous household and one in a poorer home in Bang Chan, are included in excerpts from field notes, Appendix A, p. 93.

312 In a few homes, a clay water jar was kept in the kitchen or nearby, but more frequently foods were washed, and cooking water obtained at the canal or fish pond.

The water level varied between heavy flood and threatened drought. There were no deep wells in the whole area. Rainwater was collected from the roofs and stored in jars, but during the dry season, the canal or fishpond, although low, must supply the needs of the household. In some, drinking water drawn from the fishpond was preferred, and an effort might be made to keep buffalo from wallowing in it, and to avoid contaminating it with fecal or food wastes or by bathing. Others considered the moving water of the canal preferable to pond water.

General Social Factors Affecting Nutritional Level

462 In Bang Chan, most farm and household tasks were shared by men and women. Both sexes plowed, planted, harvested and dealt with rice buyers; managed buffaloes, boats, and children; cooked, fished and cut wood for fuel; hired out as labor hands, "living in" if desired.

554 184 Though there were clear differences in socio-economic status, the daily life of the people was much alike: whether owners of land or renters, whether farming large or small acreages, the rich and the poor worked in the fields at the same tasks, produced or gathered much of their sustenance, and ran out of cash periodically. Socio-economic status was roughly defined in terms of food: a poor man "had one meal only to forego another;" a rich man "had or could get what he wanted to eat." (Sharp et al. 1953, p. 264.)

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1. Description of these products will be found on pp. 17-18.

Seasonal Activities

128 A chart has been prepared to show the climatic conditions in Bang Chan and what people were doing at different seasons (Chart 1). For convenience, the periods covered by the four rounds of the dietary survey (p. 58) are included.

22 132 241 512 871 462 883 The year starts with May, the beginning of the rice-year. At this time the rains began to soften the parched ground, and the heat slackened. School re-opened. Farmers turned to plowing, harrowing, raising the seedlings. Both sexes worked about equally in field labor, boys from 14 and girls from about 15 years of age performing tasks according to skill and strength. Everyone was in the field at dawn. The buffalo, but not the farmer, rested through the noonday heat (about 10 a.m. until 2 p.m.) and also on the weekly holy day. Meals were usually eaten about 10 a.m. and after returning from the field at dark. Although two meals a day were usual at other times, at this season, some had a third meal about 2 p.m. If the buffalo were brought home to rest, this meal could be eaten at home, but hired laborers or those working far from home often took with them rice and other foods in a (2)pin-(1)too, or tiered lunch kit.

221 132 501 442 24 With the rains, the canals had filled, so that by June buyers with big rice boats could return. The few farmers who could afford to hold onto a portion of their last year's crop sold it for a better price at this time. Vegetables and fruits which had died in the long drought were replaced, and trees were planted.

24 221 132 In July the heavy transplanting season began. Because of cooperative work habits or hiring out, people worked solidly day after day for two months on their own or on another's fields. It was dawn-to-dark, back-breaking work.

This was an anxious time. The seedlings had to go in at exactly the right time. Water level was only partly controllable. [312] Lack of rain might be remedied by pumping water from the canals but flooding would drown the plants. [871] School vacation was scheduled at this time so both teachers and [857] children could help. Older children might work in the fields, [887] while younger ones, from 8 to 13, and the aged took over the care of babies and toddlers, fished, cooked, gathered food [433] for the family and grass for the buffalo. People knew the crop was subject to drought and flood, pests of rats and worms, destruction by birds or wandering buffalo or duck, and in the end to the mysterious fluctuations of the price of rice on the world market. Moreover, some persons worried about debts, acquired from giving a ceremony or making a capital investment and sometimes from heavy gambling during the rest season.

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361 rice land. Water-ways, however, were public areas, and any
[505] convenient wide spot might be selected as a private garden. It was marked with stakes, and was apparently not disturbed by others.

262 Mushroom culture as a side line activity of rice far-
344 mers developed during the period when this study was in
433 progress. After threshing, in early 1954, two of eleven families that participated in the dietary study started raising mushrooms. Although most of these were sold, both families reported frequent inclusion of mushrooms in the family diet. One informant commented that families that planted mushrooms also ate them almost every day, and said "Adults complain that it is a wearisome food but children still like it." Mushrooms were used fried, with pork, in soup or in curry.

[434] As with tilapia, mushroom culture appears to have been undertaken primarily to increase cash income, and was abandoned when it was no longer profitable financially (see Appendix A, pp. 101-102).

Food Purchased and Cash Expenditures for Food

262 Relatively few foods were purchased, but some of these,
438 such as onion, garlic, limes, tamarind, coconut and palm sugar were so frequently used that without cash to buy them, villagers would have considered their diet monotonous. Many had their own supply of fresh and dried chilies, fishsoy, and shrimp paste, which might, however, be inadequate for their needs. Other foods not commonly produced in Bang Chan were purchased for variety.

262 Estimates of mean annual consumption and cost of pur-
435 chased foods, for 106 households in Bang Chan are shown in
128 Table 1.

262 The list of purchased foods presented by Janlekha (1955)
432 was compiled after preliminary interviews with a number of household heads. It includes the principal food items which were commonly purchased in Bang Chan. In addition to these, the affluent household studied by Sharp et al. (1953) spent appreciable amounts for vegetables (listed as cucumbers, lettuce, cabbage, etc.) and fruit (pineapple, mangoes, melons, etc.) and small amounts for peanuts, soy sauce and vinegar sauce. Eggplant and white radish were bought by more than half the families that participated in the dietary study, and were used on 11 and 8 survey days respectively. Other vegetables and fruits, bought by one or two of the 11 families, and used on not more than 3 of the 44 survey days were: mung beans, snap beans, bean sprouts, Chinese celery, cucumber, leeks, lettuce, mushrooms, sugar cane, sweet potato, taro, turmeric, (2)ma-(1)faj or rambai, Thai nutmeg, orange, pineapple, rambutan, sandorica and watermelon. Salted and pickled white radish and pickled bamboo shoots were the only

[Text continues on page 23--Analyst]

273 in 1955 (Goldsen and Ralis, 1957, p. 57) said they drank whiskey often, 22% drank occasionally, 47% seldom, and only 22% said they never drank it.

Sale of Home Produced Foods

433 434 443 Although a majority of the families in Bang Chan made most of their cash income by rice farming, sale of other home produced foods, fish, and food materials such as swamp cabbage and lotus stems which grew wild in the canals was a minor but relatively steady source of income for many families. Six of the 11 families that participated in the dietary study obtained some income from sale of food[1]. The woman frequently had major responsibility for these activities. As noted by Sharp et al. (1953), a few poor families only, added to their income by selling fish.

[462]

121 In connection with this study, our concern with sale of home produced foods is primarily with the nutritional rather than the economic aspects,[2] although the two cannot be completely dissociated. Do activities of this sort on the part of some families make a greater variety of foods available to the villagers as a whole? Are some foods sold for cash which from the nutritive standpoint, might well be kept for home use? If so, is the cash thus obtained used to purchase other foods or non-food items? Is the food purchased as useful, from the nutritive standpoint, as that sold? From the standpoint of improving the nutritive value of the diet of Bang Chan families in general, would more home production of fruits, vegetables, fish and eggs by most families be feasible, or should a few families be encouraged to develop these activities on a year round basis, to increase the local supply of food other than rice? Questions of this sort must be considered by anyone attempting to improve food habits in the village.

Annual Calendar of Foods Commonly Used

221 267 127 128 From the records extending over the period of a year, of foods used by various families participating in the dietary study, and from food records provided by children in the health classes in December 1952, February, May, June, July, September, October and November 1953, and January 1954, a calendar has been constructed showing the approximate times of year at which the foods most commonly used in Bang Chan were available (Chart 2). Foods included in this chart were

1. See Table 8, p. 62.

2. See Janlekha (1955).

[Text continues on page 29 -- Analyst]

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Chart 2. Annual Calendar of Fresh Foods Commonly Used in Bang Chan[1]

	No. Records[1]	May	June	July	Aug.[2]	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[2]	Apr.[2]
Fish													
Climbing perch	114	x[3]	x	x		x	x	x	x	x	x		
Eels	27	x	x	x		x	x	x		x	x		
Field crab (salted before use)	16	x					x	x		x			
Oysters	22		x	x			x			x			
Notopterus notopterus	10	x						x	x		x		
Serpent head	99	x	x	x		x	x	x	x	x	x		
Silurus	66	x	x	x		x	x	x	x	x	x		
(1)plaa (1)thuu	163	x	x	x		x	x	x	x	x			
Other Animal Foods													
Beef	30	x				x	x	x	x	x	x		
Chicken	72	x	x	x		x	x	x		x			
Eggs	142	x	x	x	x	x	x	x	x	x	x	x	x
Frogs	18	x	x	x				x		x			
Pork	51	x	x	x		x	x	x	x	x	x		

1. Based on 539 records obtained from school children, and observations in 11 households on 44 survey days. Figures in the column headed No. Records indicate the number of 1-day records on which the item appeared.

2. No records were obtained from school children during March, April or August, hence absence of the item from these columns means simply that the 4 households visited in each of these months did not use the item.

3. x indicates that the item appeared frequently on records obtained in this month. Note that frequency of use may be influenced by farm work and circumstances other than relative availability.

listed on 10 or more of the 24-hour dietary records obtained. For items which were major ingredients, the number of records on which the item appeared, is given.[1] Thus (1)plaa (1)thuu, which is bought by residents of Bang Chan during the busy work seasons, was used more often than any other single variety of fish named. Of the varieties caught locally, climbing perch, serpenthead, and silurus were most commonly used. Fermented fish, not included in the calendar, appeared on 53 records, and fish with kind not specified, on 180. Eggs were used more often than any animal food other than fish. Among green vegetables, swamp cabbage and (2)phag (2)ka-(2)cheed were commonly used. Bamboo shoots and lotus stalks were prominent among the non-leafy vegetables. Bananas which are grown in every garden and are available all year round were much the most common fruit, although other seasonal fruits were eaten more often in 6 of the 9 months in which school children submitted records.

Some idea may be obtained of peak seasons for use of various common foods by noting the months designed by x. Thus in January and May, serpentheads were listed on about 1/3 of the records, and were frequently served at more than one meal. Sweet potato, usually fried and eaten as a snack, was listed on 35 of 52 records obtained from school children in September. Flowers of the West India pea tree were listed on 10 of 55 records in October, and 12 of 88 in November, with occasional mention on records obtained in 4 other months.

Fruits were eaten much less often than one might expect in a tropical area where many varieties are available and fruit can be grown the year round. They were most often eaten by children as snacks, although pineapple and papaya were usually, and banana occasionally cooked in "with-rice" dishes such as curry. In September, fruit was included in the diets of less than 1/3 of the children. An average of more than one serving of fruit per child per day was recorded in 5 months only, May, June, October, November and February. In May, when (4)ma-(1)faj or rambai was in season 46 of 76 children reported having eaten it. Pineapple, listed by 35 of 61 children in June, was most often served in curry at one or more of the family meals. In October, oranges were eaten by 30 of 55 children who submitted records. Bananas (mostly of the (4)nam-(4)waa variety) topped the list in November and February.

Items mentioned on fewer than 10 records, and hence arbitrarily omitted from the chart, are worth noting as they

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1. No figures are given for sweet basil, garlic, onions, chili or limes, which were so often used in small amounts as seasoning that the count obtained would give no clear idea of the extent of their use. Some common spice plants were not mentioned on the records.

262 might provide clues to ways in which the diet may be improved.
128 Most of these items were included in lists given by Sharp et al. (1953)[1]. To those lists should be added the following items from our food records:

Green leafy and yellow vegetables: Leaves of bergamot, chili, morinda, onion, potato, pumpkin, (2)sa-(5)noo, and of the following trees: (2)ma-(1)dan, (4)khlyb[2] and West Indian pea tree; (2)kha-(1)cauaun flowers.

Other vegetables: flowers of leek and pumpkin, and Chinese or black truffle (water chestnut).

Fruits: Thai nutmeg and tomato.

Fresh foods other than fish: buffalo, duck, cobra, turtle and field rat.

128 At the end of Chart 2, sources of water for drinking and food
312 preparation have been included, not only because water is
271 properly considered a nutrient, but also because the water used in preparation of food may affect the wholesomeness of foods eaten raw or with little cooking.

271 Untreated water was the customary beverage with meals.
548 Ordinarily no distinction was made in source of drinking water
863 for children and adults although boiled water was given to mothers and infants to drink during the post partum rest
758 period (Hauck, 1956). Occasionally a sick person would be given boiled water to drink; for example one man who said he was "a little sick" and "not working" was observed to drink
272 hot boiled water from a thermos bottle. In 1955, Ralis[3] found that tea was seldom or never drunk by nearly 3/4 of the respondents. Less than 7% drank it frequently. Thus in Bang Chan no custom had grown up which would afford the general population with a measure of protection against infection from

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114 196 244 245 262 1. See Sharp et al., 1953, pp. 193-196 for a list of 32 fish known to be found in Bang Chan; pp. 293-294 for 34 fruits grown in Bang Chan, and p. 295 for 11 fruits known to be used but not grown there; pp. 296-298 for 41 vegetables grown in Bang Chan, and pp. 299-300 for 24 other vegetables used.

824 252 2. (4)Khlyb was the term used in Bang Chan for an unidentified tree of the family Leguminosae. Its sweet tasting leaves were washed in boiling water to get rid of a bad odor, then were eaten with (4)nam (4)phrig, a chili sauce.

114 126 272 3. Golden and Ralis, 1957, p. 57. The answers to: "Do you drink tea frequently, occasionally, seldom or never?" were: often, 22; occasionally, 68; seldom, 158; never, 85.

271 contaminated drinking water, but the traditional use of boiled water for newborn infants and their mothers, and its occasional use for sick persons, might provide the starting point for a desirable change.

Meal Preparation and Service

Processes and Equipment

252 The principal processes involved in food preparation for which equipment was required are: cutting solid food into bite-size pieces, pounding spices and flavoring materials, grating coconut, straining, boiling, sauteing in a small amount of fat, steaming, and roasting on a stick or metal support over the fire. Although foods were steamed or roasted only occasionally, the processes were familiar to all.

[35] The Thai kitchen had no oven. When the term "baked" was used, it might mean cooking with dry heat on a rack over the fire (as banana baked in the skin) or without fat in the frying pan (as small dried fish toasted in this way).

128 415 Equipment used during meal preparation by the 11 families observed on 44 survey days is listed in Appendix A, p. 96, that used in serving and eating food, on p. 96.

252 415 554 184 The type of food preparation and service was much the same in the relatively well-to-do and the poorer households in Bang Chan. The chief difference in equipment for food preparation and service in families of different economic status was in the number of items of one kind which were owned. Thus a poor family might own one knife and one clay water jar, whereas an affluent family would probably own several knives and a number of water jars. Equipment used on special occasions, as in preparation of food for large numbers of people, was owned by well-to-do families only. Some had enough equipment for large cooperative work parties.

Persons Responsible for Food Preparation

252 462 Food was usually prepared by the homemaker and/or older daughter, if one were at home, but all members of the family who were old enough to help, had some knowledge of food preparation and did prepare food as the occasion demanded. While preparing, cooking and serving food were more frequently carried out by women than by men, adults and school-age children of both sexes had some competence in this area. "While certain activities are normally assigned to men and others to women, the Thai maintain no rigid compartmentalization and are unembarrassed when a woman does a man's job or a man does

756 The actual ritual of these ceremonies did not take a great deal of time although it was important. Most of the [476] time and effort went into preparing and serving food. Even a [782] small celebration involved cooperative effort among relatives and friends. For every event, the Buddhist altar in the home was decorated and offerings were made to the house-spirit. A 764 big cremation might require planning in detail for years ahead: 796 invitations to priests and relatives in distant parts of the 574 country; hiring an orchestra and obtaining ceremonial gear. [533] For the largest events, when the guest lists ranged upward to [426] 60 or so priests and 400 other guests, one borrowed the hundreds of trays, dishes and bowls owned by the temple. No rental fee was charged for these, but such items had to be returned the next day, clean, and damaged articles replaced or paid for. As the day or days drew near, boat-loads of fresh provender were bought at big markets, and organized cooperative cooking went on under the direction of a competent person, [252] usually one of the "professional" cooks of the village. The [476] day before one ordination, 33 women were seen preparing vegetables, fish and soup; 13 others were making 7 kinds of desserts; about 50 others of both sexes were at different tasks, the men in particular cooking Chinese noodles, grating coconut, stirring, stoking fires. The picture was one of rows of stoves, pots so large they were stirred with a boat paddle, buckets of sugar, eggs by the hundreds, a hired generator to run a mechanical coconut-grater. On this occasion two meals were served. At another splendid (1)ngaan, the priests were fed three meals, other guests up to eight meals, over a period of two and one-half days. Workers had received additional meals beforehand.

[262] The banquet comprised rice and many dishes not met with in daily fare: Chinese noodles; "with-rice" dishes of several kinds, rich in fish, meat and vegetables: for example, fried chicken with internal organs, garlic and pepper; fried pork with mung bean; (2)mii (a fried vermicelli) with fish, vegetables, and a tomato sauce; many different desserts made of eggs, rice flour, glutinous rice, agar, coconut and coconut milk, sugar, sweet potato, dried green beans; flowers served in syrup, fresh fruit such as watermelon; ices and coffee.

128 In Appendix A, p. 102 is a list of foods bought for an 262 annual homage-to-the-teacher rite. It is the nearest approxi- 796 mation to a quantitative record of food for a ceremony that 815 the research group obtained. The prominence of purchased foods, especially of flesh foods, is noteworthy.

264 On the great day, the priests were served first, either 796 at 7 a.m. or 11 a.m., or both, always at least in part by the 792 host, who sat and chatted with them. No one else ate until

124 On the basis of experience during the pretest, the ob-
125 server began the 24-hour period of observation with an unannounced visit in the afternoon, in time to see the preparation for the evening meal. This proved to have several advantages. A householder whose home had been visited at the evening meal, and who anticipated the observer's return before breakfast, could restrain the dog, if necessary; or the homemaker might postpone washing the rice until the observer arrived to weigh it. Without such cooperation on the part of the homemaker, our records would have been much less complete
[405] than they were. Since few village families had clocks, the time when the homemaker said she would start breakfast was always approximate.

125 Foods were weighed in both the raw and cooked states,
262 and foods given to priests, fed to animals, left over, etc. were weighed so that the actual amount eaten by the family could be calculated. Previously cooked foods included in the survey meals were weighed and raw weights estimated from information obtained in other observations. If possible, snacks were weighed. School children and others who ate snacks away from home were asked to report them to the obser-
128 ver, and weights were estimated. The guides prepared for
262 the observer are included in Appendix C, pp. 110-111. Data were recorded on the schedule, shown in Appendix C, pp. 116-120. and essential information such as the weights of food, after allowing for weight of containers, was later transferred to the shorter form shown in Appendix C, p. 121. As examples some of the data obtained on 3 of the 44 survey days are shown. Examples of notes on procedures in food preparation are included with these records. For examples of notes on the food intake of individuals see Appendix A, p. 97.

Calculation of Nutritive Value of the Diets

Figures from the original records were transferred to the Form for Calculating Raw Weights of Foods Eaten (Appendix C, p. 121), and the edible portion of each raw ingredient consumed was calculated by adjusting the gross amounts according to the use made of the cooked food and the number of family members present. Procedures followed are outlined in Appendix C, pp. 113-115.[1]

Few analyses of Thai foods had been made in Thai laboratories, and most of these were for proximate composition only. Therefore, data from other available sources were used. Since Handbook No. 34 of the United States Department of Agriculture "Composition of Foods Used in Far Eastern Countries" (Leung

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[114] 1. Many of the calculations were checked by Mrs. Mary Barkley Campbell, who made independent use of the data.

128 et al. 1952) included more of the foods used than any other
262 table, it was used as the primary source of information. Other food value tables (p. 92) were used to supplement it. When two or more values were found for a given food, the more suitable one was selected on the basis of the nature of the food and the method of preparation for sampling, i.e. whether this method was similar to procedures used in Bang Chan. While this study was in progress Tables Showing Food Values for Calculation of Diet Records compiled by the Food and Drug Division, Department of Health (1953) and intended for use in Thailand, were published. These tables, however, included few analyses made in Thailand, and references were not given to the sources from which the values were compiled. For these reasons, the Thai table was used as a supplement only when values could not be found elsewhere.

For convenience in calculation, a table was compiled which contained the most appropriate values available for all items of food eaten on the survey days (Sudsaneh, Campbell and Hauck, 1954). A list of foods for which no nutritive values were calculated, for lack of available information, is given in Appendix C, p. 124. Foods for which values were found elsewhere than in tables, or for which values were imputed by the authors, are listed in Appendix C, pp. 124-125.

Although values for coconut milk were found, they did not seem to be appropriate for the product as prepared in Bang Chan. Coconut milk, (4)naam (2)ka-(4)thi, is a product made at home from fresh coconuts, and used frequently in preparing curries and other dishes. Families in Group A used considerably more water in proportion to coconut meat in making coconut milk than families in Group B, hence a single set of figures was not appropriate for both groups. Since "expressed coconut milk" which had been analyzed in Hawaii (Hawaii Agr. Expt. Sta. Bull. 77, 1936) appeared to be similar to coconut cream, (5)hua (2)ka-(4)thi, as prepared in the village, the composition of coconut milk was estimated by assuming it to contain carbohydrate, protein and fat in the same proportions as "expressed coconut milk" but to be more dilute (Appendix C, pp. 128-129)

Division of food into various food groups, and foods included in each, is shown in Appendix C, p. 126. For each survey day, the adjusted consumption of like foods was added together and the calculated total intake of each food item for each household during one 24-hour period was transferred to the Form for Calculating Nutrients in Foods Eaten. The nutrient content was then calculated. Two such calculations are shown (Appendix C, p. 122). Nutrients available[1] per capita

1. Figures used were for the edible portion of raw food, or the food as used in food preparation, i.e. dry salted radish, shrimp paste, etc., with no allowance for cooking losses.

128 per day were calculated for Groups A and B by Round and for
262 all survey days (24 days for 6 families in Group A, 20 for 5 families in Group B). The total amounts eaten per capita per day, of various food groups, and the relative nutrient contributions of these groups were also calculated.

Results and Discussion

Socio-Economic Situation of the Two Groups of Families Studied

124 General Socio-Economic Conditions. - In the course of the study the observers were able to obtain information, both by inquiry and direct observation, on the economic condition of the families. Questions about land holdings, the amount of land farmed, number of working buffaloes owned, number of priests to whom food was given and sources of income, were asked during the second Round of the survey, after the participants were acquainted with both the field workers and the procedures. As raw foods were weighed, the observer asked if they were home grown or prepared, and recorded the cost of foods purchased.

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184 Although our semple was not stratified with respect to economic condition, the families in Group B, i.e. those chosen for apparently better nutriture, proved to be more prosperous than those in Group A (Table 8). With the exception of Household 222 in Group A, rice production was the main source of income. Families in Group B had a greater capital investment in land and buffalo, and worked more land, having more productive hands per family available. Farm work was finished sooner, hence members could begin intensive fishing earlier than in Group A. All children aged 13-15, in both groups, did light farm work and/or selling in market, cooking, baby tending and care of buffalo. In all households, husband or wife or both came from old families in the community, hence had extensive kinship relations.

125 From the viewpoint of parents, the "peak of life" was
511 the time when children were no longer dependent, but produc-
592 tive, unmarried workers whose earnings stayed within the
434 family. Household 16 was such a family, forward looking,
463 progressive and optimistic. The successful and respected couple in Household 25 would enter this "peak of life" situation in a few years. Household 20 included a widower and his almost grown daughter living with his younger brother and the latter's family, and their senile mother, in harmonious cooperation. Ample land, housing, buffalo and farm labor combined with other skills, made for good living. In Household 21, two strong, unmarried sons still lived with their elderly parents. The only poor family, of low status, in Group B, was Household 23. By great industry, especially in

[Text continues on page 63 --- Analyst]

fishing and selling vegetables, they managed to obtain a fair diet. The father's skill as a masseur was valued especially at periods of heavy farm work, after childbirth, and by the cooks at a ceremonial feast. This brought in from 2 to 12 baht per week.

In Group A, Families 67 and 103 were at the most difficult period of life, with young, dependent children, and housing, land and equipment to be acquired. By great industry, including egg production from a flock of 60 chickens, and by severe "belt-tightening," Household 103 was lifting itself into a propertied position. The parents in Household 67 were shy. One or the other of the two older children often stayed home from school to look after the baby, so that both parents could work. Husband and wife in Household 12 were both very shy, the only ones in the survey group who were at all reluctant to participate. They seemed ashamed of limited food. The wife was frequently ill. In Household 222, the 14-year old daughter often gathered and sold vegetables at Minburi before school in the morning. She might have full charge of the younger children for days at a time. A daughter who worked as a servant in Bangkok contributed 50 baht per month to this household. In Household 215, the activities of the wife as medium were predominant. Pay included food, often cooked, and the free use of 3½ rai of land, as well as cash. Maintenance of a son in school in Bangkok cost about 1000 baht per year plus 60 tang of rice. In Household 2, the elderly wife's services as "boss-buyer and cook" at ceremonials, and as marriage go-between did not bring in cash, but gifts, clothing and much participation in feasts.

All families in the survey group were Thai Buddhists, and 6 of them offered food to priests more or less regularly. On 17 of the 24 survey days when the observer visited these households, food was offered. Two of the 5 families that did not customarily give food to priests, did so on one and two survey days, respectively. In one case food was offered to a son who had been recently ordained. Rice was always included in the food offered, and in 3 of the 20 instances observed rice only was given. The weight of cooked rice given by one family in one day ranged from 185 to 1210 grams, with an average of about 600 grams. In 16 instances, some cooked food such as fish or vegetable curry was given with the rice; in one instance fresh pineapple was given.

Cash Expenditures for Food. - Mean total, and per capita daily cash expenditures for food for survey days, are shown, by household in Table 8. (See Table 2, p. 23 for division of food expenditures for Groups A,B) Although cash expenditures for food varied considerably, the amounts in all cases were small, and approximated figures obtained by Janlekha (1955) for 106 households. Larger consumption of animal products, which were the most expensive items purchased,

235 Eggs and poultry. - Every household which took part in the survey raised chickens, and 3 of the 11 households had ducks also. In both groups of families, most of the eggs produced were sold. Home consumption of eggs on survey days was small.

228 Fish. - Each family studied had a fish pool. One family only, Household 25 in Group B raised tilapia. They began tilapia culture during the third round of the study, too late to ascertain how this might affect fish consumption in the family.

251 Preservation of Foods at Home. - Home food preservation was practiced to a very limited extent only, fish products being the principal ones produced.

Dried fish. - Families in both groups salted and dried fish throughout the year whenever they were available in excess of immediate needs.

Fermented fish. - In 10 of the 11 households, fermented fish was prepared. The 6 families in Group A had prepared a total of 30 kg., and 4 of the 5 families in Group B, a total of 29 kg. The largest amount prepared in one household, for one year was 10 kg.

Shrimp paste. - Because shrimp were caught in insufficient quantity, shrimp paste was prepared by only 6 of the 11 families. Four families in Group A prepared a total of 26 kg., and 2 families in Group B prepared a total of 7 kg. These amounts were insufficient for their needs.

Fishsoy. - One family only, in Group A, prepared fishsoy. All others in both groups purchased this product.

Buffalo meat. - During the survey year, the buffalo belonging to one family died. Some of the meat was used fresh for curry, and the remainder was salted, dried and sold.

Comparison of Caloric and Nutrient Intakes of the Two Groups With Each Other and With the Estimated Allowances.

128 146 In Table 11, the estimated calories and nutrients available to the two groups of families, are shown together with the estimated allowances.

146 On the average, the number of calories, and amounts of protein, iron, niacin and ascorbic acid in the diets of persons in Group B, the apparently better nourished group, approximated or exceeded the conservative allowances. For Group A, this was true for niacin and ascorbic acid only, the calories being 11%, protein 15% and iron 21% below the allowances.

146 absent, and in 6 of these, ankle jerk was absent also. In
164 Group B, the apparently better nourished group, one adult and two school boys had knee jerk only absent. In Group A, Household 12, the father, mother and 21 year old son all had both knee jerk and ankle jerk absent. The son was diagnosed by the examining physician as having frank beriberi at the time of the medical inspection. In Household 2, the father and 23 year old son had both knee jerk and ankle jerk absent, but the mother had no signs of thiamine deficiency. In Household 67, mother and father had both knee jerk and ankle jerk absent. The mother had lost 3 of her 6 children when they were 3 or 4 months old, with symptoms such as convulsions and voiceless crying, suggestive of infantile beriberi. When the third child died, the mother had symptoms of beriberi, and the physician who conducted the medical inspection considered the death of this child to be due to infantile beriberi. Clearly the thiamine content of diets of some of the families studied was inadequate to meet their needs under varying conditions of activity and stress. Beriberi was the one frank deficiency disease observed while these studies were underway in Bang Chan (Hauck, 1956).

146 Fat provided only about 9 to 10% of the calories. Coconut oil contains only about 0.5% of linoleic acid (Anantakrishnan, et al., 1949), but the essential fatty acid content of the diet as a whole was not estimated.

146 In summary, although the estimated nutrient intakes of
164 Group B were in general more favorable than those of Group A, the contrast between the two groups was not striking. Perhaps we should have anticipated this from the fact that the groups did not present a clear contrast in apparent nutriture. In Group A, 19 of the 30 persons examined had a total of 36 possible signs of nutritional deficiency. In Group B, 8 persons had a total of 9 such signs. Judging by both the apparent nutriture of the household members, and by their estimated nutrient intakes, the diets of both groups were in need of improvement.

146 Contribution of Food Groups and Certain Common Foods to the Nutritive Values of the Diets

[128] Contribution of Food Groups and Individual Foods. - The percentages of the total calorie and nutrient intakes provided by various food groups for households in Group A and B are shown in Table 12.

146 Rice and other cereals. - Rice was the staple food,
262 which provided over 4/5 of the calorie intake and more than half of the protein for both groups. Much of the difference in calorie and protein intake of the two groups was due to the greater rice consumption of Group B. Rice was also the

[Text continues on page 72··· Analyst]

146 more than fats and oils as such.
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Bananas were grown by all families that participated in the study, but were eaten only occasionally, primarily as snacks. Tamarind and lime were used often in small amounts in making sour curry and chili sauce, and bergamot rind was used for seasoning. Papaya and mango, both of which are good sources of vitamin A and C, were each eaten once only during the survey. The green papaya was used in curry. Fruits are relatively abundant in Thailand, the year round, yet fruit made minor contributions to the diets of families studied in Bang Chan.

Fats and oils. - Fats were used in small amounts to pan fish, meat, eggs and vegetables, and provided about 1/7 of the total fat in the diet of Group A, and 2/7 for Group B. Coconut oil, which was less expensive than pork fat, was more often used in Group A.

Sugar. - Palm sugar was used in small amounts in the preparation of many "with-rice" dishes, and occasionally in snacks, i.e. guava dipped in a mixture of sugar, salt, chili, mung beans cooked in palm syrup and the like. The amounts used were small, and the contribution to nutritive value was slight. By Western standards, the consumption of sugar in Bang Chan was almost negligible.

146 Spices. - Spices were commonly used in food preparation,
263 particularly in hot dishes (i.e. those made with chilies) but little information on their nutritive value is available.

146 Alcoholic beverages. - In the families surveyed, all men
273 except the elderly father in Household 21 drank occasionally, but most of the women did not. The husbands in Households 12 and 67 drank heavily at times. No estimate can be made of the contribution of alcoholic beverages to caloric intake in these households.

146 Summary of Nutrient Contributions of Foods Commonly
262 Eaten in Two Groups of Households. - The contribution in terms
028 of calories and nutrients of certain foods used by 25% or more of the families studied, i.e. by 3 or more of the families on at least one survey day is shown in Table 13. Items selected for inclusion in this table are those which either made significant contributions to the nutrient content of the diets of Groups A and B respectively, or were major items in terms of amounts used or frequency of use. For certain items used frequently for seasoning, information on nutritive value was too scant to warrant inclusion in this table. Figures given are for average consumption per capita per day, based on all persons in the specified groups, and all survey days. For items used by all or most families every day, such as rice, fresh fish, chili, coconut products, and sugar, the figures represent approximately the usual daily per capita consumption.

106 For items used less frequently, the figures are correspond-
262 ingly less than the usual amount eaten. Thus, sweet potato, which is represented as 18 grams per day per person in Group A, actually appeared on 3 records only. One family of 8 persons ate 1200 grams of sweet potato at one meal and a substantial amount later the same day. Most items appear on the lists for both groups, but sweet potato, sweet basil and bananas were included on the list for Group A only, and glutinous rice which is used as a sweet in this area, appears on the list for Group B only. Note that a few common foods account for most of the nutrients in the diets of both groups. These common foods account for only about 80% of the calcium and vitamin A value and slightly less of the ascorbic acid in the diets of Group A. The list for Group B accounts for about 70% of the calcium and 60% of the ascorbic acid in the diets of this group. The variety of green leaves used once or twice only on survey days by Group B, and the number of different seasonal fruits used by both groups in small amounts as snacks, probably account for this.

264 Contribution of Snacks to the Nutrient Content of Diets. -
[855] On the average, 4 out of 5 children had one snack per day,
262 whereas only one adult in 6 did so. The following items appeared most commonly: various kinds of fruit, 40 times (orange 7, banana 6, pineapple, watermelon and mango each 5 times, guava, jujube and Manila tamarind each 2 times, olives, rambutan, rambai, star gooseberry, (2)ta-(1)koo and Thai nutmeg each once,) coconut and bread each 13 times, glutinous rice 8, mung bean 7, truffles 6, products made of rice flour 6 times, and a variety of other items including rice noodles, sweet potato, taro, bean sprouts, lotus stalks, lotus seeds, popcorn, products made of cassava flour, sugar cane, pork and milk from 1 to 4 times each. Salt, and/or palm sugar were
[146] eaten with a number of the snacks. Although they contributed only about 2% of the total calories, and from 1 to 3% of most nutrients, snacks contributed 16% of the total ascorbic acid for Group A and 11% for Group B.

Seasonal Variation in Food Preparation, Meal Patterns, Food Costs and Calorie and Nutrient Value of Foods Eaten

128 In Table 14, a summary including the number of meals
252 prepared, time spent in meal preparation, number of "with-
264 rice" dishes, and cash expenditures for food is given by
[435] rounds, for families in each group.

252 Number of Meals Prepared. - Food was cooked twice on
512 each survey day in 3 of 6 households in Group A and 3 of 5 households in Group B. Heavy farm work or vending which kept the mother away from the house sometimes accounted for once-
[443] a-day food preparation. One housewife who took food to market in Bangkok, cooked food twice a day only during the period shortly before the birth of a child, when she was not vending.

[Text continues on page 79 --- Analyst]

252 Another, who had time during Round IV to prepare food twice a
262 day, preferred to prepare more in the morning when she expected
264 to offer food to her son who had just been ordained. In two
578 instances an evening meal was not prepared because the father
[525] and mother had been invited to a feast in connection with an ordination ceremony, on one occasion a mother did not prepare food because she was gambling. In all of these cases, the evening meal at home consisted of leftover rice and other foods prepared earlier. The housewife in Household 215 sometimes received cooked foods from visitors in return for her services as medium, and these were used, together with leftover foods, for the evening meal. The meal patterns of the two groups of families did not appear to differ greatly.

252 Time for Meal Preparation and Number of Dishes Prepared. - In general, the time for meal preparation varied with the number and type of "with-rice" dishes prepared. The "hot" dishes usually required more preparation time than the mild ones, because of the time required to pound spices, and to cut up ingredients. Once-a-day food preparation reduced the time required for cooking. More time was apt to be spent on food preparation when the housewife was least busy with farm work or other work outside the home. Some of the families visited early in Round I had not begun heavy farm work, and in some, children, who were less skilled, did the cooking.

262 Cost of Food Purchased. - The lowest cash expenditure
435 for food by any household on a survey day was 0.12 baht, for
511 a family in Group A, and the highest 16.24 bahts, for a household in Group B (Table 14, p. 78). On a per capita basis, however, the mean cash expenditure for food by Group A households, for all survey days, was slightly higher than for households in Group B (Table 8, p. 62), and no evidence was obtained that in general households in one group tended to spend more for food than households in the other. Despite the wide variation in cash expenditures for food on the survey days, the tendency for cash expenditures for food to decrease in both groups of households as the survey year progressed was apparent. Most of the rice was sold at the end
242 of Round III. The cash went for capital investments, not
432 food, during Round IV. With time to drain ponds and to fish
[221] intensively, and with ceremonies to attend, people did not need to buy fish and meat which were relatively expensive.

146 Calorie and Nutrient Value of Foods Eaten. - The
221 seasonal variation in calorie and nutrient intake of the two groups of families is shown in Table 15. As one would expect,
[128] the average calorie intake was higher during Rounds I and III, when relatively heavy farm work associated with planting and harvesting was under way, than during Round II, which was primarily the growing season for rice, or Round IV, when the harvest was in, and the earth was dry so that preparation for the next planting had not yet begun. Greater consumption of rice in Rounds I and III was largely responsible for the

[Text continues on page 81 - Analysis]

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[128]

Form for Calculating Raw Weights of Foods Eaten

Dietary Survey, Bang Chan — Household No. 12 — Date Jan. 14, 1954

Amounts of foods prepared and eaten — No. persons in household 3

Meal - menu	Raw ingredients				Cooked food	Use of cooked foods					Adjustments-raw wt.		
1	2[1]	3	5	6	9	10	11	12	13	14	For amt. eaten	15	For No. people
4:00 p.m.													
Cooked rice	Polished	610			1640				500	1140		3	
Baked egg plants	3 egg plants	370		370	240				0	240			
Fish "salad"	Lemongrass (HG)[2]	36		36)									
	Holy basil (HG)	44	20	24)	115				0	115			
	1 fish (cooked)	52	12	40)									
	Lime (1/2 fruit)	30	12	18)									
Cooked rice	(Leftover)				250				0	250			
6:55 a.m.													
Cooked rice	Polished	950			2390				800	1590		3	
Roasted fish	2 fish	112			96				0	96			
Cooked rice	(Leftover)				500				0	500			
Chili sauce	Bird pepper (HG)	12		12)									
	Shrimp paste	10		10)									
	Garlic	8		8)	45				20	25			
	Palm sugar	10		10)									
	Lime	12	4	8)									

1. For identification of column numbers, see the original schedule, pp. 118-119 and pp. 113-114 121
2. HG stands for home grown.

128 In calculating values to be used in our estimates of
146 nutrient content of diets in Bang Chan, we made two assump-
262 tions: 1) that the "expressed coconut milk" described by Miller et al. was similar to coconut cream as made in Bang Chan, and 2) that coconut milk as made in Bang Chan differed from coconut cream primarily by dilution. When coconut milk was made by successive extractions after coconut cream had been prepared, the combined weights of cream and milk were taken to represent the yield of coconut milk from the weight of meat used.

The ratio of coconut cream to coconut meat was approximately the same, 0.30 for households in Group A and 0.33 for those in Group B, but Group A used more water in making coconut milk than Group B. By calculation, we obtained the following figures for the percentage of protein, fat and carbohydrate in coconut milk as made in the two groups of households.

Estimated Composition of Coconut Milk as Made in Two Groups of Households, Bang Chan

	Grams per 100 gm. E. P.		
	Protein	Fat	Carbo.
Group A	0.15	1.0	0.7
Group B	0.5	3.6	2.4

The need for a guide for calculating composition of various coconut milks, based on actual analysis of the products as made at home is apparent. Since coconut milk was used almost daily in Bang Chan, use of the figures which we found in the literature would have introduced a major error into our calculations. Using figures from the table designed for use in Thailand (Food and Drug Division, Bangkok, 1953), the average per capita caloric intake per day, from this source for the families studied would have been over 300 calories, as compared to about 45 calories, using the figures calculated on the basis of observed procedures in the village.

/Pp. 130-139 contain no data on Bang Chan and the Central Thai and were not processed for the AO7 Central Thai file./

INTRODUCTION

121 In the study of food habits and health in Bang Chan, Thailand, mothers and small children were the focus of special attention. We were interested in these groups not only for their own sake, but because in an area where frank deficiency disease was not common, inadequacies in the diet might be reflected in the condition of these vulnerable groups to a greater extent than in the general population. Food habits in this rice producing village have been described (Hauck, Sudsaneh, and Hanks, 1958; Hauck and Hanks, 1959) and information has been presented on nutrient intakes of 11 families (Hauck, Sudsaneh, and Hanks, 1958; Hauck and Sudsaneh, 1959).

128 In the present paper, general procedures are described first, followed by sections on 1) health and care of mothers and 2) of infants, 3) diet of mothers during pregnancy, postpartum, and lactation, 4) feeding of infants and small children, and 5) growth in height and weight of infants and small children in Bang Chan.

PROCEDURES

124 Some of the information presented herein was obtained by direct observation, but much of it resulted from interviews, usually with the mother. One of our first tasks, therefore, was to develop appropriate schedules for such interviews.

Schedules for Interviews.

During the early weeks of getting acquainted in the community, we had preliminary unstructured interviews with a number of pregnant women and mothers of young babies. Frequently the child's father, a grandparent, or other family member would be present. Informants were encouraged to discuss infant feeding, common customs associated with childbirth, and other subjects
125 of interest to the research group. From the information so obtained and from conversations with workers at the Mother and Child Health Center in Bangkok, two schedules were drawn up. In general, both schedules included three areas of inquiry: 1) clinical history, especially such information as might have a bearing on the nutrition and health of the child, 2) food intake at various periods, and 3) cultural customs and ideas of interest in relation to the Cornell Thailand Project. In this category some items were included because of their interest from the standpoint of an anthropological study rather than because of any assumed relation to nutrition or health.

GROWTH IN HEIGHT AND WEIGHT OF INFANTS AND YOUNG CHILDREN

Evidence on growth in height and weight of Thai is scant. So far as we have been able to learn, all available studies have been cross-sectional. We, therefore, undertook, in the limited time available, to make longitudinal studies of growth of infants and small children and elementary school children in Bang Chan. Observations on the latter were summarized by Thorangkul (1957) and those of infants and small children, by Smith (1958).

In general Thai children of elementary school age are shorter and weigh less than Western children of the same age. Heights of children in the Bang Chan elementary school were, on the average, less than mean heights for Thai children given by Dr. Yong Chutima (1939), and they were much below mean heights at various ages from charts (class II) in use at the Department of School Hygiene, Bangkok. Mean heights of adult men and women in Bang Chan were slightly below those recorded by other observers who have measured groups of Thai men and women (Hauck, 1956). Without further study one cannot say whether the short stature of Thai as compared to Western peoples is due to inheritance, environment, or both. Nor do we know why school age children and adults in the rice producing village of Bang Chan were, on the average, somewhat shorter than their counterparts in Bangkok only 20 miles away.

Thorangkul (1957) found that although children 7 to 14 years of age increased in height in successive 3-month intervals, a large proportion of them failed to gain weight or even lost at times and that such failure to gain occurred in more children during the dry season than during the wet season. The reason for this was not apparent from our observations. Two possible explanations are: 1) use of untreated canal water may lead to heavier infestation with intestinal parasites in the dry season and 2) leafy vegetables are almost lacking, and other vegetables are in short supply at this time. One would expect the temporary shortage of vegetables to be reflected in growth failure only when the diet is borderline in respect to some nutrients as it appears to be in Bang Chan (Hauck et al., 1958; Hauck and Sudsaneh, 1959). Either of the possible causes suggested might affect the nutritional state of other family members as well as elementary school children. All those drinking canal water and eating "adult foods" could be affected directly, whereas infants who are still largely breast fed might be affected indirectly through the quantity and quality of mother's milk available to them.

In this section observations on the growth in height and weight of infants and small children in Bang Chan are presented.

In some age groups fairly large numbers of children were observed and in other groups relatively few. None of the groups up to 4 1/2 years of age with whom the children in this series could be compared included fewer than 30 individuals. The numbers of boys and girls measured at each age were about the same.

Dr. Amara Chandrapanond (1957) reported the mean heights and weights of 20 babies who were weighed and measured at monthly intervals over a period of a year. She did not report values for boys and girls separately, but, in general, at each age these fell between those for males and females as reported by Dr. Montri (1939).

In figure 1[1] the median heights of boys and girls in Bang Chan together with the number of individuals who were measured at 3, 6, 9, 12, 15, 18, or 21 months are shown in comparison to the height curves constructed from values reported by Dr. Montri (1939). Corresponding median weights are shown in figure 2.[1] Although the groups are small, the tendency for both height and weight of young children in Bang Chan to be below that of children attending a well baby clinic in Bangkok is clear.

One should note, however, that Dr. Montri characterized the children he observed as "free from disease", whereas some of the children of Bang Chan had colds, skin infections, or other minor disorders which might have affected their weights. Such disorders are very common, and we do not know whether or not they disqualified children attending the Well Baby Clinic from inclusion in the series for which heights and weights were reported.

Graphs of height-age and weight-age were plotted for each child in this study and for small groups of children who were observed regularly over a year or so at the same ages.

Most of the children increased in height in a fairly regular fashion, the slopes of their height curves being about the same as the curve drawn from Dr. Montri's[1] values, although there were individual variations in this. The height curves of many more children of Bang Chan were below than were above the curve drawn to Dr. Montri's values. Of the 35 girls measured, the height curves of 6 were above, 6 were about the same as, and 23 were below the curve drawn to Dr. Montri's values for girls. Of the 36 boys measured, the height curves of 9 were

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1. Mean values reported by Dr. Montri were plotted at 1-month intervals for the first 11 months, then at the midpoint of the intervals he reported. For example, measurements reported for children 1 to 1 1/2 years of age were plotted at 1 year 3 months.

[TEXT CONTINUED ON PAGE 41].

1 [See p. 34 - Analyst; 2 [See p. 40 - Analyst]

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[For information on the author's analysis and interpretation of the results of the Sentence Completion Test, see category 116, pp. ix, 4-8, 11-12, 39, 53-54, 96, and 142-199.]

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FOREWORD

The Cornell Thailand Project, like other Cornell University studies in community development, is a long term investigation in the field of the processes involved in changing cultural behavior in a non-industrialized society. Field research was begun in 1948 in the central plain of Thailand with base line studies of the rice farming community of Bang Chan and its environs. A collaborating staff of Thai and Americans representing different disciplines has continued to work in Thailand at Bang Chan and elsewhere in a series of phases extending to the present.

The first interim report issued by the Project gives a general account of the economic, political and social organization of Bang Chan in 1948-49 together with some material on health and diet (Sharp et al., 1953). Since the circulation of this first interim report was limited, some of the salient characteristics of Bang Chan should be outlined here.

Bang Chan is located some twenty roadmiles northeast of Bangkok, the rapidly growing major metropolis and capital of Thailand. The village is between two and three miles west of a small district administrative center and market town, Minburi. A century-old canal and to the north of it a post-war hard surface road connect Minburi and Bangkok so that villagers have easy access to these two centers by boat or bus.

In 1954, when data for the present study were still being gathered, the population of Bang Chan was about 1700, divided among about 300 households. Roughly 60 per cent of the households were made up of independent nuclear families consisting of parents and unmarried children. The average size for all families was 5.7 persons. Rice farming was the main occupation of 80 per cent of all families. The population in 1954 worked and lived on about 2800 acres (7000 rai) of land. With the exception of some 120 acres (300 rai) used for the home sites and home gardens scattered along the network of canals in the village, all land was devoted to the cultivation of wet rice. Nutritional density is thus practically the same as population density. Of the rice crop, 60 per cent or more may be sold, the remainder providing seed, feed, and the staple food of the people. During the wet season and into the cooler dry season, from May or June to February, the growing of the single crop of rice is the main activity. The hot dry season from March until the rice planting begins again is a period of fiestas, ceremonies, and visiting.

The Thai countryside is divided into hamlets, each with a headman in charge of the thirty to sixty households of the hamlet. Seven such hamlets constitute the Bang Chan community. (In the Project studies they are identified by the initials BC and KY followed by a number).

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ACKNOWLEDGMENTS

114 For the period of her field study, 1952-53, the author received an award for advanced research from the United States Educational (Fulbright) Foundation in Thailand.

The author wishes to express her gratitude for the assistance of her Thai co-workers: Dr. Anusith Rajatasilpin and Miss Sapha Indrasud, whose services were provided by the Food and Drug Administration, Bangkok, Thailand, through the courtesy of its director, Dr. Yong H. Chutima; Dr. Chumlong Kittiveja, whose services were made available through the courtesy of Dr. Luang Vach Vidyaddhana, Dean of the Dental School, University of Medical Sciences, Bangkok; and Miss Saovanee Sudsaneh, who served as field worker with the Cornell Thailand Project during 1953-54.

[126] Stool examinations were made at the Department of Pathology, Chulalongkorn Hospital, Bangkok.

[128] Some preliminary tabulations and analyses of data were made at the Division of Statistical Services, National Economic Council, Bangkok, through the courtesy of its director, Dr. Tooi Xoomsai.

ooo For the interest and friendliness of the people of Bang Chan, without whose cooperation the study would not have been possible, the author is particularly grateful.

▼ [p. vi is blank]

in Tables 1 and 2.[1]

Heights of children in the Bang Chan elementary school were, on the average, less than mean heights for Thai children given by Yong Chutima (Chutima, 1939). They are much below the mean heights at various ages, from charts (Class II) in use at the Dept. of School Hygiene, Bangkok.[2] Curves for mean weights of children in Bang Chan cross Dr. Yong's average curves, but are well below the average curves for girls and boys in Class II, School Hygiene charts (Figures 1 and 2). When compared with mean weights for children of the same height and age, from tables in use at the Dept. of School Hygiene, however, the two curves are seen to be similar (Figure 3). Mean heights and weights for rural children as reported by Zimmerman (1931) are not very different from those in Bang Chan.

In general, Thai children are shorter and weigh less than western children of the same age. For example, at all ages, mean heights and median weights[3] for both boys and girls in Bang Chan fell below the 10th percentile of the Iowa school children whose measurements are reported by Stuart and Meredith (1946) (Table 3). Weight of clothing was probably about the same for the two groups. In general, the median weight for a given age, in Bang Chan, corresponds to the weight of the 50th percentile for Iowa children 2½ to 4½ years younger. Thus the median weights for 8 year old boys and girls in Bang Chan, were similar to the weights of the 50th percentile of Iowa boys and girls 5 to 5½ years old, and the median weights of 13 year old boys and girls in Bang Chan were similar to weights of the 50th percentile of Iowa boys and girls at 10 and 9½ years of age, respectively. The tallest and heaviest boys and girls of these ages in Bang Chan were shorter and lighter than the corresponding median values for Iowa school children. On the average, however,

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1. Median weights are generally considered to be more representative of a group, but mean values are included as well, for comparison with results of certain other studies.

2. Unpublished data, based on measurements of over 15,000 children, both urban and rural, made over a period of years, and compiled by Dr. Laeng. Furnished through the courtesy of Dr. Ladda of the Dept. of School Hygiene, Bangkok. Subjects were grouped as Classes I and II, of which roughly 1/3 were considered Class I.

3. Most of these observations were made in November or early December, 1952. On the basis of subsequent observations, many children were found to weigh less in May than during the previous February, but weight gains were again observed the following August and November.

TEXT CONTINUED ON PAGE 15

[see pp.9-13-An] [see p. 14-An.]

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mats on the floor as most of them would have done at home. Relatives were welcome; indeed they were supposed to come and help.

Nature and Incidence of Illness and Injury, and Treatments Sought by Residents of Bang Chan. - Evidence concerning the nature of illness and injury in Bang Chan was obtained in connection with the clinical examination of school children and persons in the random sample of village households; from questions in two types of structured interviews with household heads: 1) in the entire village, and 2) in one hamlet, KY-7; and from the field notes of workers associated with the Cornell Thailand Project.

In connection with the clinical examination, information was obtained from heads of 30 of the 31 households whose members were examined (See schedule in Appendix A).[2] In this group none reported any accident or injury, and 26 said that no member had been ill within the year. Illness was reported as occurring in 4 households only. In one of these, a 49-year old man reported loss of sensation over the extremities and other symptoms which led the physician in the research group to conclude that he had beriberi. As treatment, this man had used an herb recommended by a priest, a native medicine given him by a neighbor and had gone to a private clinic at Minburi where he received an injection.[1] In another family, a 39-year old man who had asthma, took an advertised remedy which he purchased from a drugstore. Two children in the third family had fever for 8 days, for which a traditional practitioner prescribed herbs. In the fourth family, a 1-year old child with eczema was taken first to a traditional practitioner, then to a private clinic in Minburi where he was given an injection.

On the basis of other observations, however, we believe that illness and injury are more common in Bang Chan than is suggested by the replies to this particular inquiry. For example, no mention was made in one of the households surveyed of a baby who had been too ill to be weighed and measured, when team members called, and who recovered in a day or two without outside help. Coming as they did at the end of the clinical examination which was new to most of these people, perhaps the questions asked seemed relatively unimportant. No attempt was made to probe beyond the person's reply to the questions as stated.

Replies to questions in connection with an intensive

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1. From casual observation, one is led to believe that the villagers have considerable confidence in "injections," although the nature of the injection received or desired, is not usually specified.

2 [see p.51 - Analyst]

Procedures Used in Obtaining Information Recorded on Schedule for Clinical Examination, and Descriptions of Possible Signs of Nutritive Failure

114 For the clinical portion of the nutrition survey, the team consisted of a Thai physician, who carried out the clinical examination, the nutritionist, who made the physical measurements, a second-class chemist, who did the hemoglobin determinations and served as interpretor, and a local boy who not only propelled the boat but helped in other ways such as giving directions to the children concerning preparations for being weighed and measured. The nutritionist was the only non-Thai on the team. The physician's internship had been served in a hospital in which he had opportunity to see many patients with nutritional disorders.

• 128 The material which follows is primarily descriptive of the procedures agreed upon in advance of the clinical examination. When different descriptions of a given sign were obtained from the various sources, the criteria which the physician agreed to use, after discussion with the nutritionist, are stated here. Some of the signs described were not observed in any of the persons examined in Bang Chan.

Before beginning the survey, the examining physician and the nutritionist agreed that only signs which could be considered undoubtedly positive should be so recorded.

128 In preparing the schedule, care was taken to avoid
125 diagnosis, i.e. the physician was to record what he saw. If the examining physician believed diagnosis or probable diagnosis would be helpful, he recorded this under Comments. Thus Comments included such items as the following:

1. Diagnosis of deficiency disease, together with nature of onset, association with other conditions such as pregnancy, malaria or dysentery.

2. Obvious present disease as trachoma, ring worm etc. or evidence of past disease, as smallpox scars.

3. Complaints such as bloody stools, or other conditions which might affect adversely the general health and nutrition.

The schedule was designed to be used with all ages and both sexes. Items relating to menstrual and child bearing history were placed at the end, to be used for adolescent girls and women.

Comments on the items on the schedule follow:

1. Hamlet and house number. Information given by the school child or householder was checked later with the census data.

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125 2. Name. The name was recorded according to the Mary Haas system of transliteration, modified for use on a typo- 128 writer. Later a code number was given each individual examined.

3. Sex. The appropriate symbol, M or F, was circled.

4. Birth date, when known, was recorded in Thai, according to the Thai calendar. This information was later translated into age in years and months. Information given by school children was checked against that in the school records, which were obtained by the school teachers from the Naai Amphoee, or district officer. At present, parents are required by law to register the birth of a child within 15 days. In practice, however, the interval between birth and registration is frequently longer, and the recorded date may be somewhat later than the actual birthdate. In preparing height-weight-age tables, age to nearest birthday was used. In a few cases, the birth date as given by a school child and that in the school records differed enough so that age to nearest birthday was in doubt. Data for such children were omitted in preparing the tables.

5. Marital status was recorded either as single, or the number of years married. To avoid embarrassment if there had been no legal marriage, the question was phrased so as to mean "How long have you had a house?"

6. Weight. A bathroom scale with 1/2 kg. divisions, with a magnifying glass over the scale reading so that one might interpolate to 1/4 kg., was used. All persons were asked to stand with the feet squarely on the platform, with the toes not extending beyond it. In order to get weights under as nearly standard conditions as possible, school children and adults were instructed to remove all but a minimum of clothing. All boys, [29] and the younger school girls removed their blouses, belts, and any items in pockets, leaving only short trousers, for the boys, and for the girls, a Thai-style skirt (phaasin) or standard western style school costume consisting of cotton skirt with attached bib and shoulder straps. Older girls were asked to re- [29] move the outer blouse and belt but were allowed to keep on the under blouse or camisole, as well as skirt. The children did not wear shoes to school.

[29] In the homes, preschool children were usually weighed nude, older girls and women in inner blouse, and phaasin or phaanung, and the men in trousers only.

Several examples of each type of clothing were weighed. Clothing worn by children whose body weight was 22.5 kg. or less, usually weighed considerably less than 1/4 kg., and would therefore make no detectable difference in the observed weight. Clothing worn by the larger school children and adults weighed, on the average, about 1/4 kg.

School children were asked to empty the bladder before being weighed. To minimize the effect of food, school children were weighed between 10 A.M. and noon. We were unable to carry out these precautions in connection with the survey of persons in a random sample of village households.

7. Height. A locally made wooden measuring device, hinged so as to fold (4 sections, each 50 cm. long) and provided with a sliding set square, was used for measuring height. The individual was told to stand with heels and shoulders against the measuring device, with chin parallel to the floor. Persons old enough to cooperate were asked to take a deep breath and "stand tall." The set-square was brought into contact with the person's head and the height, to the nearest 1 cm., noted. Smaller school children sometimes had to be helped to assume the desired position. An infant was measured by putting the device on the floor, and placing the baby on it. The knees were then pressed down, so that the backs of knees were in contact with the scale. One team member then placed a flat-surfaced object such as a book, perpendicular to the scale, against the soles of the feet, while another brought the set-square into contact with the infant's head.

8. Bicristal diameter was measured with a pelvimeter. The subject stood, with heels together, before the examiner, who felt for the highest points of the iliac crests, and placed the pelvimeter, with firm pressure. The pelvimeter was calibrated in centimeters, but readings were estimated to the nearest 0.5 cm.

9. Cristal height. The height of the iliac crest was taken as the vertical distance of the left iliac spine from the floor. The subject was asked to stand with left side toward the measuring device used for height, and the distance of the set square from it. The examiner felt for the iliac crests, placing her right hand so that the thumb was at the level of the tip of the iliac crest. She tried to see that the subject's pelvis was held level and not tipped. An assistant then lowered the set square to the examiner's thumb, and the height was measured by reading the level of the set square.

10. General appearance and vitality. This item represented the examining physician's impression of the behavior of the subjects. Facial expression, attitude, degree of alertness, and behavior while waiting for the examinations were taken into account. Thus a child with good vitality would appear alert and interested, whereas a child who was rated poor might be apathetic, abnormally subdued or lacking in initiative.

11. Hemoglobin was determined by means of a Spencer Hb-Meter (American Optical Co., Scientific Instrument Division, Buffalo 15, N.Y.). Values were recorded in grams per 100 ml. of blood. Very little resistance was encountered to the finger

puncture, although a few adults and two school age children refused. No attempt was made to determine hemoglobin for most children under school age.

12. Stool examination. Each school child was furnished with an appropriate container labelled with his name. Pupils were asked to bring the container, with stool sample, to the teacher. Specimens were examined at the Pathology Department of Chulalongkorn Hospital.

13. Hair.

a. Dry and staring. Hair which has lost its normal sleekness and luster, and is dry and brittle.

b. Diminution or loss of pigment. In dark haired people, an auburn tinge is evident in mild cases. (Note: None of the cases seen in Bang Chan had progressed beyond this to "ginger" or tow-colored hair).

14. Eyes.

a. Photophobia, when present, was always recorded. If obviously due to some non-nutritional eye disease, this fact was recorded under comments.

b. Lachrymation, which is often associated with photophobia, was recorded when elicited by brief eye examination.

c. Blepharitis. Inflammation of the muco-cutaneous junction of the eyelid, with or without scaling and crusting or loss of eyelashes. If blepharitis was obviously associated with some non-nutritional eye disease, such as trachoma, this fact was recorded under comments.

d. Xerophthalmia. The conjunctiva is abnormally dry and appears thickened, yellowish and opaque.

e. Excess conjunctival tissue. Thickening of the bulbar conjunctiva, which appears opaque and yellowish. The tissue is moist. When the subject moves the eye from side to side, a thickened conjunctiva is thrown into a moving ripple of folds.

f. Bitot's spots. An extreme form of thickening of the epithelium of the bulbar conjunctiva. The spots resemble patches of chalk paste which have been striated with a pin.

g. Corneal vascularization (gross). Loops of newly-formed capillaries appear near the corneal margin, and extend onto the cornea. Since a slit lamp, which is necessary for observation of early stages, was not used, gross changes only could be noted.

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15. Face.

a. Folliculosis. Pouting of the sebaceous and pilosebaceous follicles of the face.

b. Nasolabial seborrhoea. A scaly or greasy desquamation; flaky accumulations of seborrhoeic material in the nasolabial folds.

c. Dyssebacia. A condition probably representing a severer degree of folliculosis. The pouting sebaceous follicles contain plugs of greasy material. The condition is usually most marked in the nasolabial folds, but in severe cases extends to the nose, cheeks, chin and the whole butterfly area.

d. Suborbital pigmentation. A brownish or greyish-brown area of pigmentation under the eyes, often seen in severe starvation.

16. Lips.

a. Cheilosis. The earliest change in cheilosis is a loss of the normal uniformly shiny appearance of the vermilion of the lips. A somewhat "velvet-like" appearance is associated with a milky "bloom". In more severe cases the lips are reddened, capillaries are engorged and the mucosa at first appears thin and shiny; later, scaling, ulceration and cracking may occur, with crusts of blood and serous exudate.

b. Scars of past cheilosis: Multiple antero-posterior linear scars of the lips; the vermilion of the lips takes on a slightly tissue-paper like appearance.

c. Angular stomatitis. A lesion which varies in severity, ranging from slight scaliness with small cracks in the epithelium at the corners of the mouth to a pale, moist and ulcerated appearance with fissures extending onto the neighbouring skin of the face.

d. Scars of angular stomatitis. Scars in the corners of the mouth.

17. Tongue.

a. Papillae atrophied. The tongue is dry, smooth and glazed, with atrophy of the papillae.

b. Papillae hypertrophied.

c. Edema. Swelling which is evidenced by indentations of the teeth along the margin of the tongue.

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128 d. Color change - scarlet. A bright red color of the tongue, like that of raw beef.

e. Color change - magenta. The normal pink color of the tongue is changed in the direction of blue or purple.

f. Appearance - fissured. The presence of deep central or lateral fissures which may run antero-posteriorly or transversally.

g. Appearance - geographical. Superficial erosion of the tongue, appearing in irregular patches. These are redder than the unaffected area.

h. Not ascertained - Betel. This category was added to designate cases in which the tongue was so coated from betel chewing that color changes and changes in papillae could not be noted.

18. Gums.

a. Swelling. Swelling of the interdental papillae with an increased tendency to bleeding when the papillae are pressed. Later, the whole gum may be swollen and purplish.

b. Redness (gingivitis). The gums are red and hyperemic, particularly at the margins.

c. Recession of the gums.

d. Retraction. The margins of the gums become detached from the tooth.

e. Loss of interdental papillae. The papillae no longer fill the interdental spaces neatly.

19. Parotid glands enlarged. Mild degrees of enlargement may be detected more readily by observation from above or behind than from in front. Both Smith (1952) and Nicholls (1951)[1] mentioned the association of parotid enlargement with malnutrition in the tropics.

20. Thyroid enlarged. Obvious enlargement was recorded. An item was included for scars of thyroidectomy, if any should be seen.

21. Betel. If the subject chewed betel frequently or habitually, so that the teeth were stained, this item was checked "yes". In the "no" category, may be some persons who have tried

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1. Nicholls, 1951, p. 354.

125 betel chewing, but have not persisted in it.
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22. Teeth. Changes in the teeth were noted by means of a series of symbols on two dental diagrams, one for deciduous and one for permanent teeth. Teeth just erupting, missing, carious or filled were noted. A dentist examined the teeth of the school children, in good natural light, using mouth mirror and probe. Inspection of persons in the random sample of families was carried out by the physician without mirror or probe, therefore the record is of gross changes only. If a tooth was crowned, the physician inquired whether the tooth had been sound or carious before being crowned.

23. Skin.

a. Symmetrical dermatosis. Any skin disorder which had a symmetrical distribution was noted, and the physician's diagnosis recorded under Comments. Pellagroid dermatosis begins as an erythema resembling sunburn and develops into a symmetrical, rough hyper-pigmented dermatosis with sharply defined margins, usually on areas exposed to sunlight. Areas may desquamate with serous exudate in the centre.

b. Phrynoderma. A type of follicular hyperkeratosis which occurs on the back of the arms, on the thighs, abdomen, shoulders and buttocks. Viewed through a lens, the enlarged glands are seen to be plugged. The eruption can be felt by passing the tips of the fingers over it.

c. Perifollicular congestion. Congestion occurs around the hair follicles, frequently limited to the legs and forearms.

d. Petechiae. Pinpoint hemorrhages, which are most apt to occur around hair follicles.

e. Xerosis. Dryness of the skin, diminution or absence of sebaceous secretions, sometimes also of sweat. (Note: Crackled skin was originally included as a separate sign. No clearly defined cases were noted, however, and since the physician was uncertain of the distinction between early stages of crackled skin, and xerosis, the latter term was used to cover all such lesions.)

f. Loss of elasticity. Diminution of suppleness of skin seen as a fine wrinkling, particularly over the calves. When the superficial skin is pinched up and released it returns very slowly to its smooth condition.

g. Atrophic skin. Thinning of the skin, generally most marked on legs below the knee. The skin usually appears smooth, tightly stretched and shiny.

Note: The skin changes known as xerosis, loss of elasticity and atrophic skin, which are associated with defective nutrition, mimic closely the changes in senility.

125 h. Ulcers. Single or multiple ulcers, other than
• 128 those associated with varicose veins, confined to the skin of the legs below the knees.

24. Edema, if present, was noted.

25. Knee jerk. Absence of the knee jerk was recorded.

26. Ankle jerk. Absence of the ankle jerk was recorded.

27. Calf tenderness. The patient's reaction was noted when the calf muscles were squeezed firmly.

28. Inability to rise from squatting. The patient is made to squat with his thighs fully flexed on his legs, and is asked to rise. When this is done with difficulty, the hands grasping the knees and aiding the legs to bring the body into an erect position, the test is positive.

(Note: This test was not applied to persons who were obviously active and had good muscular coordination. Thai customarily sit or squat on the floor, and would be peculiarly aware of such difficulty.)

29. Liver enlarged.

30. Spleen enlarged.

For this part of the examination (items 29 and 30), the subject was asked to lie on his back with his knees flexed, to relax the abdomen and take a deep breath. The physician palpated the costal margins in the usual manner. If liver or spleen were found to be enlarged, the appropriate space was checked, and the description of size and texture of the organ entered under Comments.

31. Posture:

Winged scapulae. The fingers can be placed easily under the inner border or tip of the scapula.

32. Skeleton.

a. Frontal bossae. Protruding forehead, giving the person a "box-headed" appearance.

b. Beaded ribs. A line of enlargement at the costochondral junction of the ribs.

c. Enlargement of epiphyses at wrists.

d. Bowed legs. The subject was asked to stand with feet parallel and together, the body erect. If the space between his knees was more than 1 finger breadth (1.5 cm.) or the legs below the knees curved outward obviously, the person was considered to be bow legged.

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• 128 e. Knock Knees. The subject was considered to be knock kneed if the knee joints overlapped markedly.

33. Diarrhea. As phrased, the question meant literally "Do your bowels run or not?" If the answer was affirmative, the physician asked further questions to determine about how often this occurred. "Frequent" diarrhea meant that watery stools were passed every week, i.e. that stools seldom were formed. "Occasional" diarrhea meant the passing of watery stools once in a long time, and "Never" meant that diarrhea had not occurred within the past 6 months.

34. Constipation. The question as asked by the physician meant literally "Do you have a stool every day?" The physician checked "frequent" if the subject did not usually have a bowel movement each day; "occasional," if the subject usually had a daily bowel movement, but once in a while a day was skipped. "Never" meant that the subject had a bowel movement daily during the previous 6 months.

Note that this question does not relate to constipation, in the true sense, since it tells nothing of the character of the stool or feelings of the subject, but is confined to the interval between stools.

35. Menstruation.

a. Regularity. This was indicated by a check mark after yes or no.

b. Duration. The question "How many days does it last?" The number of days, as stated by the informant, was recorded.

c. Interval. The replies were grouped into 3 categories: 1) usual interval, i.e. about 1 lunar month; 2) markedly less than 1 month; or 3) markedly longer than 1 month.

d. Menarche. The age in years, at first menstruation, was recorded. Young girls, who appeared adolescent, were asked by the physician if they had menstruated yet. To be sure the question was understood and properly answered, a woman school teacher questioned these girls separately.

e. Menopause. Age, in years, of last menstruation, was recorded for woman who had passed the menopause.

36. Children. Appropriate numbers were recorded in each category.

a. Total children born . . . . . .

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b. Number of children alive now . . . . . .

c. Stillbirths . . . . . .

d. Deaths in utero . . . . . .

e. Miscarriages . . . . . .

f. Other deaths . . . . . ., i.e. deaths of children born alive. Notes were made on the age and circumstances of death. When the description was clear, the physician noted the cause of death.

g. Age of the oldest child . . . . . in years.

h. Age of the youngest child . . . . . in years.

The investigator noted whether or not related items such as years of marriage, age of oldest child, age of youngest child, age at menarche, and age at menopause, were reasonably consistent. A few replies were discarded as unreliable.

II. DEFINITIONS

Definitions are here provided only for a few basic terms within the context of this survey. An attempt will be made to discuss the many concepts contained in the questionnaire before the beginning of the actual field work, as the desirability to keep this guide short makes it unadvisable to go into lengthy details at the present time.

A household is a single person or a group of persons making one economic unit and distinguished as one kitchen unit. It is likely that members of the same household sleep under one roof (or roofs) belonging to one person, but the main criterion of the definition is the kitchen unit. With each kitchen goes one household. There is occasionally more than one household under one roof; this is found when more than one kitchen is encountered in one dwelling unit.

The head of the household, shortly referred to as HH, is the person whom other members of the household consider to be the head and who lives in this household - we exclude absentee heads of households.

Relationship to the HH is to be designated as whatever applies among the following categories: husband, wife, son, daughter, father, mother, mother-in-law, or "other relative."

Respondent, shortly referred to as R., is the person being interviewed. The R. should preferably be the HH, or, in the absence or nonavailability of the HH, an articulate adult member of the household.

Articulate member of the household is a person in a given household who could be considered eligible to substitute as R. for the HH. An articulate member of the household is another member of the same household as the HH. Such an articulate member should be an adult in the position to express himself without unusual difficulties and he is expected to have a scope of views not much less limited than those of the HH.

III. PROCEDURE

Our survey will be conducted in Bang Chan, shortly referred to as BC. This is a rice village about 20 miles from Bangkok. The Cornell Research Center has been working in this village for many years and friendly relations have been established all over. Senior members of the Cornell Research Center have taken great pain in maintaining good rapport with the villagers and are, naturally, anxious that nothing should occur to damage the established fine relations. Each interviewer is expected to keep this in mind all the time while in BC.

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[For the author's discussion of his methods of processing data, ratings, scoring and sampling techniques, passim, see category 116, pp. 52, 53, 94, 127-156, 170-199, 215-221, 240-243, 271-311, and 364-391.]

243 426 432 Differentiation in paddy prices is limited to cases where farmers have received in advance the payment for paddy to be delivered at harvesting time. This is a common practice which is called in Thai "tog khao" (lit., fall rice). Usually, the advance price received by the farmer is about half or not more than three-fifths of what he would normally receive. Considering that cash is usually received about a month or two before the delivery of the paddy, it would seem that tog khao is a kind of loan with as high a rate of interest as from 25 to 50 per cent per month.

243 426 465 A similar practice is adopted with respect to advanced payment for piecework, where pieceworkers are committed to uproot, transplant, or harvest at about half of the prevailing rates. This is called tog raeng (lit., fall labor).

243 128 427 Tables 24 and 25, in the section on land tenure of Chapter III, show a wide range of rental rates of rice lands which have not demonstrated any marked difference in crop producing ability.

Rates of interest in Bangchan vary greatly from 0 to 10 per cent per month. This topic will be discussed more fully in later sections of this chapter.

243 434 556 The important point that should be observed in connection with these differentials in paddy prices, rates of interest, rentals, and wage is that it is the less affluent farmers who usually bear the burden of higher costs due to these practices. Thus, these differentiations serve only to widen the gap between poor and well-to-do farmers.